

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
3 June 2004 (03.06.2004)

PCT

(10) International Publication Number  
WO 2004/047327 A1

(51) International Patent Classification<sup>7</sup>: H04B 1/707

(21) International Application Number:  
PCT/EP2002/012814

(22) International Filing Date:  
15 November 2002 (15.11.2002)

(25) Filing Language: English

(26) Publication Language: English

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

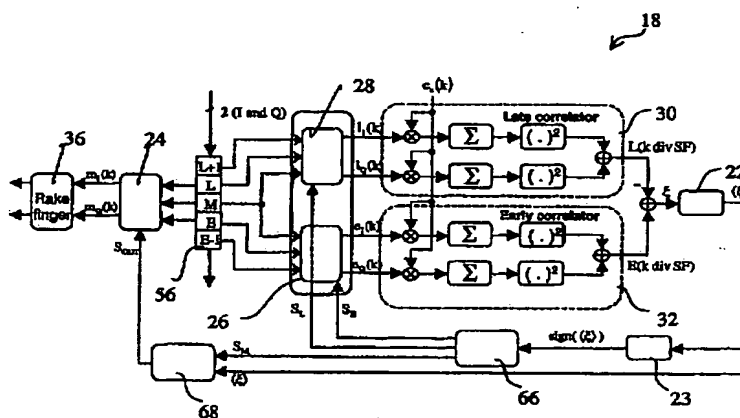
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: EARLY-LATE SYNCHRONIZER HAVING REDUCED TIMING JITTER



(57) Abstract: A device for maintaining fine alignment between an incoming spread spectrum signal and a locally generated code in a digital communication receiver comprises: - a delay line (56) for storing a plurality of consecutive samples (E-1, E, M, L, L+1) of the incoming spread spectrum signal; - three digitally controlled interpolators (24, 26, 28) for determining by interpolation between consecutive samples an interpolated early sample (e), an interpolated middle sample (m) and an interpolated late sample (l); - two correlators (30, 32) for calculating an error signal ( $\xi$ ) as the difference between the energy of the symbols computed from the interpolated early (e) and late (l) samples; - a circuit for generating a control signal ( $S_L OUT$ ) for controlling the interpolation phase of the digitally controlled interpolator (24) for the early sample (e), and - a digital non-linear filter (68), for smoothing the control signal ( $S_L OUT$ ) of the interpolator (24) for the early sample (e), enabling the update operation of the control signal only when the absolute value ( $|\xi(n)|$ ) of the error signal at a time instant n is smaller than the absolute value ( $|\xi(n-1)|$ ) of the same error signal at a time instant n-1.

Rec'd PCT/71 16 MAY 2005

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